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NOTICE OF ALLOWANCE AND FEE(S) DUE

881 7590 07/18/2008

STITES & HARBISON PLLC
1199 NORTH FAIRFAX STREET
SUITE 900
ALEXANDRIA, VA 22314

EXAMINER

RUTHKOSKY, MARK

ART UNIT

PAPER NUMBER

1795

DATE MAILED: 07/18/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,185	12/18/2000	Takayuki Araki	P06971US00/L	2588

TITLE OF INVENTION: FLUOROPOLYMER MATERIAL WITH SULFONIC ACID FUNCTIONAL GROUPS AS A SOLID POLYELECTROLYTE
FOR USE IN FUEL CELLS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$0	\$0	\$1440	10/20/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

881 7590 07/18/2008

STITES & HARBISON PLLC
1199 NORTH FAIRFAX STREET
SUITE 900
ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE-FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Takayuki Araki

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nonprovisional	NO	\$1440	\$0	\$0	\$1440	10/20/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
RUTHKOSKY, MARK	1795	429-304000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/147; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

1

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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STITES & HARBISON PLLC 1199 NORTH FAIRFAX STREET SUITE 900 ALEXANDRIA, VA 22314			RUTHKOSKY, MARK	
			ART UNIT	PAPER NUMBER
			1795	
DATE MAILED: 07/18/2008				

Determination of Patent Term Extension under 35 U.S.C. 154 (b)

(application filed after June 7, 1995 but prior to May 29, 2000)

The Patent Term Extension is 0 day(s). Any patent to issue from the above-identified application will include an indication of the 0 day extension on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Extension is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

09/700,185

Applicant(s)

ARAKI ET AL.

Examiner

Mark Ruthkosky

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERIT IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/28/2008.
2. ☒ The allowed claim(s) is/are 30,35,36,38-40 and 51.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/28/2008 has been entered.

Claim Rejections - 35 USC § 112

The rejection of claim 30 and the claims depending from claim 30 under 35 U.S.C. 112, first paragraph, has been overcome by applicant's remarks showing disclosure of the molecular weight of segment B on page 23 of the instant specification.

Claim Rejections - 35 USC § 103

The rejection of claims 30, 35-36, 38-40, 46, and 49-52 under 35 U.S.C. 103(a) as being unpatentable over Cisar (US 6,492,431) OR Cisar (US 5,635,039) has been overcome by applicant's amendment to the claims and the declaration filed 4/28/2008.

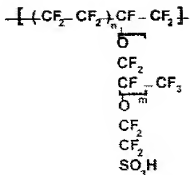
Allowable Subject Matter

Claims 30, 35, 36, 38-40, and 51 are allowed.

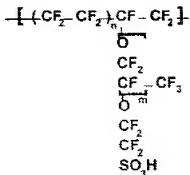
The following is an examiner's statement of reasons for allowance:

The instant claims are to a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer and/or a graft copolymer, wherein the copolymer contains one or more blocks essentially consisting of segment A and one or more blocks essentially consisting of segment B, the segment A combines with the segment B, wherein the segment A has a molecular weight of 5,000 to 1,000,000, and the Segment A is a copolymer chain comprising (a) an ethylenicfluoromonomer containing sulfonic acid functional groups each represented by Formula (1) $CX_2=CX^1-(O)_n-Rf-SO_2Y$, wherein X and X^1 may be the same or different and are each hydrogen or fluorine; Y is FI, C1, or OY^1 wherein y^1 is hydrogen, alkali metal or C₁-C₅ alkyl; Rf is C₁ to C₄₀ divalent fluoroalkylene or C₁ to C₄₀ divalent fluoroalkylene having one or more ether bonds; and n is 0 or 1; and (b) at least one type of ethylenic fluoromonomer copolymerizable with the ethylenic fluoromonomer (a) and containing no sulfonic acid functional groups, the segment B is a fluoropolymer containing no sulfonic acid functional groups, has a molecular weight of 3,000 to 1,200,000, and has a crystalline melting point of 100°C or higher or a glass transition point of 100°C or higher, wherein the ratio of segment A : segment B in the segmented fluoropolymer is 5:9~to98:2 30:70 to 90:10 wt. %.

The prior art does not teach the material as claimed. The most pertinent prior art has been cited. For example, Cisar (US 6,492,431) teaches a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups.



Cisar (US 5,635,039) teaches a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups. The material is defined to be Nafion, which has the following structure:



One segment block contains polytetrafluoroethylene groups (PTFE) and another segment block contains perfluorovinyl ester with sulfonic acid functional groups. The crystalline melting point is over 300 C. The perfluorovinyl ester with sulfonic acid functional groups segment includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups. It is further noted that the polymer may include a sulfonyl fluoride group (col. 13, lines 7-17.) The material is commonly known as Nafion, which has an equivalent weight of 400-1600, (see col. 7, lines 45-end for a weight of 1100.) The ratio of segment A to segment B in the fluoropolymer is in the range of 5:95 to 98:2 wt. % (col. 5, lines 60-65.)

The references do not teach ratio of materials or the molecular weights for segment A and segment B. The references are silent to the molecular weight of the material. The Cisar references, however, disclose materials that comprise segment blocks containing polytetrafluoroethylene groups (PTFE) and perfluorovinyl ester with sulfonic acid functional groups, commonly known as Nafion. The references show that each segment has a function in the copolymer. The Nafion component gives an ion-conducting element to the copolymer and

the PTFE component gives a structural reinforcing element to the copolymer (see '431, col. 8, lines 30-44. and col. 7, lines 15-30.) Applicant's have submitted a declaration (4/28/2008) under 37 CFR Section 1.132 that shows data for the instant invention as compared with Nafion, which is found in the cited prior art. Applicant argues on pages 20-23 of the submitted amendment that the claimed combination of materials result in a different product having the noted properties. Based on these submissions, the rejection has been overcome and the claims are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. The application did not include a separate abstract. Further, the non-elected claims have been canceled.

The application has been amended as follows:

- I. Cancel claims 1, 5-29, 37, and 41-44.
- II. Please change the abstract to the following:

ABSTRACT

The invention is a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer and/or a graft copolymer, wherein the copolymer contains one or more blocks essentially consisting of segment A and one or more blocks essentially consisting of segment B, the segment A combines with the segment B, wherein the segment A has a molecular weight of 5,000 to 1,000,000, and the Segment A is a copolymer chain comprising (a) an ethylenicfluoromonomer containing sulfonic acid functional groups each represented by Formula (1) $CX_2=CX^1-(O)_n-Rf-SO_2Y$, wherein X and X^1 may be the same or different and are each hydrogen or fluorine; Y is FI, C1, or OY^1 wherein y^1 is hydrogen, alkali metal or C₁-C₅ alkyl; Rf is C₁ to C₄₀ divalent fluoroalkylene or C₁ to C₄₀ divalent fluoroalkylene having one or more ether bonds; and n is 0 or 1; and (b) at least one type of ethylenic fluoromonomer copolymerizable with the ethylenic fluoromonomer (a) and containing no sulfonic acid functional groups, the segment B is a fluoropolymer containing no sulfonic acid functional groups, has a molecular weight of 3,000 to 1,200,000, and has a crystalline melting point of 100°C or higher or a glass transition point of 100°C or higher, wherein the ratio of segment A : segment B in the segmented fluoropolymer is 5:9~to98:2 30:70 to 90:10 wt. %.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

/Mark Ruthkosky/

Primary Examiner, Art Unit 1795